Comments on the A/E/C CADD Standard Release 2.0 Model Files and Symbology

Submitter: Rodger Tellefson, USAE District, Sacramento

Comment: My one general comment is to combine layers/levels (not discipline specific) that have interconnected data. Example: Level 12/B-BORE-HOLE and Level 13/B-BORE-IDEN should be on the same layer/level because one will not be made visible without the other. What I did in AutoCAD is to create the appropriate symbol (i.e., Boring or Trench) and then make a text attribute to go along with it. (Mr. Tellefson provided two AutoCAD symbols as examples)
Response: Placing the identification number for the boring on a separate level/layer from the boring symbol will help in the mapping of levels/layers to the Spatial Data Standard.

Comment: My one Geotechnical specific comment is to not call everything "Boring Logs", rather call them "Exploration Logs". Example: B-EXPL-FLDI, etc.
Response: On querying several sites about changing the designation, all wanted them referred to as Boring Logs since it is a more common term.

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Submitter: Kendall Waldie, USAE District, Fort Worth

Comment: All mechanical equipment has to have space reserved for maintenance access. I would suggest adding a level for this on all the mechanical file types. None of the other disciplines want to see our service area on their plans and we frequently only show it in one place. We typically use a dotted line at weight 0 or 1 to indicate the service area.
Response: The Electrical discipline also has a level/layer for this type of information. A similar level/layer will be added to the Mechanical model files. It will be level 59 with a definition "Clearances and working space information."

Comment: The symbology for sanitary sewer piping below the floor is impossible to read. I would not make any distinction between sanitary sewer piping above or below the floor. We never make a distinction on the plans now. Nearly all the horizontal sewer piping will be below the floor. The gap in the symbology makes it nearly impossible to read.
Response: Agreed. The below ground sanitary sewer lines (existing and new) will be removed.

Comment: Single line for low-pressure natural gas. Symbology uses the letters "LPG" on the line. This is used for liquefied petroleum gas in the industry. I would suggest changing the identifier to "G" or "NG". "G" is what is commonly used in the industry.
Response: The current line style has "G" for Natural Gas.

Comment: Piping flow arrows. What is the data field in the middle of the arrow for?
Response: The gap and data field will be removed.

Comment: Line styles that use letters in them cannot be mirrored effectively. The text appears backward. This makes the line style nearly useless. A lot of piping is placed using the mirror command to ensure alignment and symmetry. If you do not know a way to place the line style where it will not mirror the text, I would suggest using the place line command to place piping and then place text on the line to label it.
Response: The only problem we had in mirroring text in MicroStation was when vertical custom line styles were mirrored. However, the line style was still legible. Recommend that instead of mirroring the custom line style, that the copy parallel command be used. Placing text and lines instead of using a custom line style, just makes the file size bigger. If the use of mirrored linestyles is a problem, recommend this be submitted to Bentley for correction.

Comment: There are many graphic symbols that should have a place in the menus of the workspace. I have attached a copy of our legend. Nearly every one of these symbols should be a cell and be in the workspace.
Response: Thank you for providing the legend. We will compare the symbols in it to the Standard and determine what corrections/additions need to be made.

Comment: How are we supposed to apply this standard to projects in 3D? Architectural TriForma, HVAC for TriForma and Structural TriForma are becoming viable design products. However, they build the entire facility in 3D using a single or multiple files. These files are then used to generate files that would be similar to the model files described in the A/E/C standard. These are then used to create sheet files. Unfortunately, there is not a lot of control available for level, color and weight definitions when the 3D model is "sliced" to make the A/E/C model files. Should we try to apply the A/E/C level conventions to the 3D files and then treat the 3D files as A/E/C model files and then name the "sliced" files as other model files?
Response: This is a good comment. We have made no "official" decision on what to do here. True object applications have sufficient intelligence to "present" themselves in accordance with the standard (e.g., applications like ArchiCAD). They can meet both the level/layer and color requirements. The commenter is correct that parametric modelers like TriForma cannot. Our "unofficial" answer is that those agencies actually using the suite of TriForma applications maintain the standard inherent in TriForma and not try to meet the A/E/C Standard. Note that we have discussed this with Bentley and they assure us that TriForma can be configured to meet the standard, but no one has tested or implemented it. This comment should remain an unresolved/open comment.

Comment: How does importing spreadsheet or word processing data into the file affect the process? We are using Excel spreadsheets to assemble schedules and Word files to assemble large sections of text. We are then using OLE links to import the text into the design file so that changes to the Excel or Word file are automatically reflected in the design file.
Response: Importing schedules and text shouldn't be a problem. Just make sure that the levels/layers they are placed on correspond to the standard.

Comment: Mechanical HVAC Plan model file: What happened to the colors? Don't get me wrong, I like the fact that there are now more than 2 colors on the drawing now. But why are we using color 46 for return duct? That is a dark orange that is hard to see on a black background. What is wrong with using another color? Or does this have something to do with the future integration of the A/E/C standard into a GIS environment?
Response: With a line weight of 0.50 mm (LW=3), this color seems to be very visible on a black background.

Comment: Mechanical HVAC Plan model file: Floor diffusers, registers and grilles. I would advise against using any of the dark blue colors such as the color 33 shown for this level. They are very difficult to see on black backgrounds.
Response: With a line weight of 0.35 mm (LW=2), this color seems to be very visible on a black background.

Comment: Mechanical HVAC Plan model file: Condensate piping. The abbreviations shown are CONDWR and CONDWS. These are logical choices, however, they are too long. The line style will never reach a long enough distance to have the letters show up. Also, condensate drain lines are not shown. I would suggest CS for condensate supply, CR for condensate return and CD for condensate drain.
Response: The current Mechanical linestyle library does have a condenser supply line with CS and condenser return with CR. We will add a linestyle for condensate drain line with CD as the designation.

Comment: Mechanical HVAC Plan model file: Controls. Change the line style to V. Frequently the control wiring is shown with style 1 or 2. However the control devices are shown as style 0 as indicated.
Response: Level/layer 38 M-CONT-WIRE (low voltage wiring) added to the HVAC Plan. Line style is 1 or 2. This level/layer is compliant with the National CAD Standard.

Comment: Mechanical HVAC Plan model file: Equipment access doors. Suggest changing this to the line style to V. Frequently, an access door is on the bottom of a duct and is shown as dotted or dashed to indicate its location.
Response: Will put 0, 1, and 2 in the Line Style column for this level/layer.

Comment: Mechanical Details model file: Change the line style for "Graphics, gridlines and non-text items" to V. Details frequently use line styles other than 0.
Response: Agreed. This would apply to all discipline Detail model files.

Comment: Mechanical Sections model file: Change the line style for "Material beyond section cut" to V. Line styles other than 0 are frequently used.
Response: Agreed.

Comment: Mechanical Controls model file: Change the line style for "Graphics, gridlines and non-text items" to V. Controls frequently use line styles other than 0.
Response: Agreed.

Comment: Mechanical linestyles: Typically, we only have fuel oil supply, return and vent. So, delete FUELOD, FUELOF, FUELOG and change FUELOS to Fuel Oil Supply.
Response: Agreed.

Comment: Mechanical linestyles: Refrigerant discharge and roof drain have the same line style. Also, we don't use refrigerant discharge lines often. I would suggest deleting REFRD and move ROOFDN to the plumbing section. That is where the roof drains will be shown.
Response: Agreed.

Comment: Plumbing linestyles: I cannot recall ever seeing a design for piping with argon gas. Delete ARGON.
Response: Agreed.

Comment: Plumbing linestyles: Move FUELOT to the mechanical lines since that is where the fuel oil piping is usually shown. Also, delete the fuel oil piping from the plumbing section.
Response: Since the Fuel System levels/layers are in the Plumbing discipline, we agreed to remove them from the Mechanical discipline and have them in the Plumbing.

Comment: There are several line styles that are really more civil than plumbing. Anything outside 5'-0" of the building is considered civil. Granted we show how the piping approaches the building and enters. However, we do not use the civil notation outside the building and then change once inside. Rather we use our regular notation for the whole drawing. I would suggest copying these to civil if they are not already there: NTGASX, SSWAFX, STRAFX and WATERL.
Response: Agreed.
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Submitter: Jim Mrozek, USAE District, Detroit

Comment: Would like to comment on the Hydrographic Survey model file. The soundings on level 49 are being shown as color 40. Color 40 is like a grayish color. Most MicroStation users use a black background. Using color 40, soundings would not show up very well, and would be hard to see over a black background. Up here at the Soo in the Detroit District we have been using Color #4 (Yellow). It shows up really good on a black background. We also are using italics (23) as our standard sounding font.

Response: The question was sent out to various engineers in the Corps of Engineers. Here are the responses:

"Color may have to vary as some Districts require more than one color to depict sounding information at different depths (e.g. above/below required project depth). I agree that color 40 does not show up well on screen. The font used may also be an issue as data thinning programs found in hydrogahic survey software and other applications have parameters based on the desired plot scale of the sounding text. Also, the decimal point of a sounding typically indicates horizontal location - font may or may not affect this depending on how data is imported into a design file. We use font 3 at NAE. Line weight is probably a lesser issue as pen tables can be used to alter output." - Scott Flanagan (New England District)

"Jim's recommendations are fine. Either a weight of 0 or 1 is good. Yellow works fine but I know some like to use different colors to represent soundings within the project depth, shallower, or within allowable over depth. Our people might hesitate at font 23 because they have unnecessarily gotten hung up over thinking they need to use mono-text type of font because the decimal point comes closer to the actual sounding location. I think font 23 is fine because it uses less space and the location of the decimal is certainly within the tolerance of the survey." - Fred Hardy (New England District)

For this level/layer, since most sites show the soundings at different colors, the line weight will be left at 0.18 mm, but the color will be changed to Varies.

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Submitter: Hank Braswell, USAE District, Vicksburg

Comment: Level 3: What exactly are "reference targets" and "viewport windows"? These need to be defined.
Response: We will change the description of this level/layer to match the National CAD Standard description: "Non-plotting graphic information."

Comment: Level 4: What is "poche"? There is no English word "poche." Is seems to be the same as what is given at www.allwords.com <http://www.allwords.com> for the French word poché:

> poché (n.) po·ché
>
> 1. the walls, columns, and other solids of a building or the like, as indicated on an architectural plan, usually in black.

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Response: Agreed this is an architectural term that is not used often. Will revise the definition of the PATT layers/levels to read "Miscellaneous patterning and hatching."

Comment: What specifically is an "Auxiliary Power Plan"? This term needs to be defined.
Response: The Center passed on this question to the Electrical FAC for response. Here are some of the responses:

"There does not appear to be a good formal definition of auxiliary power. This has generally been used in the past to refer to emergency power, special power systems such as 400HZ, DC, control power, etc. Note that special systems such as alarms, PA, CCTV, etc are designated in the standard by Table 4 as Electrical Auxiliary Systems (EY) and Table 5 Special Systems (SS). If no specific definition is determined, this file type needs to be eliminated from standard to avoid misapplication and non-standardization." - Dick Newlin (Fort Worth District)

"Ages ago in Seattle, this was the plan that we would put the fire alarm system devices, PA system, telephone outlets, etc. Over the years, this info has been combined with the power

plans. Maybe since there are Telecommunications Model files that have levels for these devices, the "Aux Power Plan" is no longer needed?" - Cynthia Masten (Seattle District)

Since there is a strong chance that this model file could be misused, it will be removed until a more standardized model file for auxiliary power can be developed.

Comment: In the Electrical Model Files, Details and Risers/One-Line Diagrams, Level 11, does "Graphics" mean anything other than symbols, details, and diagrams?
Response: Basically, it means all the graphic linework required to create a detail, riser diagram, or one-line diagram.

Comment: Symbols need to have all elements snappable for accurate placement.
Response: Agreed. Will make all symbols snappable.

Comment: Symbols with Enter Data Fields need to have enough blanks (sufficient field length) and also some guidance on what to put in the blanks. Most such symbols in the cell library need more field length.
Response: Data fields were added to certain symbols at the request of various users of this standard and at the lengths they prescribed. Most often, the length of the data field was based on use in a metric project. If there are symbols where the data field does not have the proper number of character fields to accommodate users, the Center requests that a list of those symbols be submitted with the recommended number of data field characters.

Comment: Symbols should be filled (like HRUN3) and not use copied-parallel elements (like HRUN2).
Response: Actually both symbols were created using parallel lines to mimic area fill. In the PDF document, the symbols just appear different. The reason some symbols are filled with parallel lines, as apposed to area fill, is because that is the way field offices submitted those symbols for inclusion into the standard. If there are symbols that need to be changed to area fill, the Center will accept recommendations for symbols to be converted.

Comment: The TSWS really needs updating to make it fully functional. You and Edward certainly have improved it, but many features and symbols are not accessible or functional. Also, the default type of line tool needs to be user selectable. For example, when drawing schematics, wiring diagrams, and the other types of diagrams defined in NEMA ICS 1-1993, para. 9.1.1, the only line tool that is required is the *Place Smart-Line Tool* or even just the *Place Line Tool* because most of the lines are straight and predominantly vertical and horizontal. Frequently, however, TSWS will present the *Place Spline Curve*. Only doing circuit lines for lighting, receptacles, etc. on electrical plans does one need this tool.
Response: All circuit line levels/layers have the Place Curve command active. All the other levels/layers that were using this command have been changed to the Place Line command.

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Submitter: Gary Boyd, Southern Division, NAVFACENGCOM

Comment: Architectural Details model file: I don't know what the philosophy behind the DETAILS.pdf file was but it is not very useful in the real world of detailing architectural drawings. Look at the approach in the SECTIONS file - much more likely to be used because it is simpler, and it follows the reason of drawing sections. That is, to show what is solid and what is hollow. Details need to show what the individual materials are, where they are, and how they are assembled. There doesn't need to be a separate level for everything that could be possibly found in a detail. Ask one simple question: what items of graphics would you NOT want to show in a detail? In other words is there a reason to echo off any particular level? Do we NOT want to let the builder know where the flashing is?
Response: The Electrical/Mechanical FAC and the Design FWG also agreed with this reasoning. They could not see a reason that one detail item/material would need to be turned off

separately from another. Typically they create the graphics all on one level/layer. The detail is either "on" or "off". Therefore, for Release 2.0 all details will have one level/layer for graphics with varying line style, width, and color.

Comment: Architectural Roof Plan model file: The ROOF-EDGE level is not needed. What is listed here (Roof Internal Gutters) should go in the -DRNS grouping. The ROOF-OTLN takes care of the roof edge. And it should be more appropriately called ROOF-GEOM for "geometry". That would let it take care of ROOF-LEVL also, which is not needed. ROOF-WALL? Isn't that just a wall, so use the WALL-EXTR label and level. Similarly we don't need a ROOF-HRAL or ROOF-STRS - use the A-STRS and HRAL ones. Again all of these comments are trying to get back to simplicity.
Response: Internal gutters and drains are separated out for the Mechanical engineer when the Piping plans are developed. Roof outline is a National CAD Standard layer, therefore the designation A-ROOF-OTLN must remain. You are correct on A-ROOF-LEVL, however it is for use by the FM users. If changes in roof levels were not shown on another level, there is the potential that someone might mistake a level change for two buildings abutted to each other. Agree 100% on getting back to simplicity, a Roof Plan could possibly be treated as a Floor, but it has so many specialized items, that a separate model file (and therefore separate levels) is required.

Comment: Architectural Floor Plan model file: The FLOR-NUMB level is not needed - the FLOR-IDEN should suffice should it not? There is a need to differentiate between the room shape (FLOR-RPRM) and the floor outline (FLOR-OTLN) but instead of calling them room perimeter shape and floor outline perhaps labels more in line with why we need them to be on different levels like structural floor shape or geometry and finish floor surface. This allows us to use the actual CADD shapes for area calculations for the structural floor material and finish floor materials separately. Also makes it great for assigning materials to finish surfaces for rendering.
Response: Other disciplines requested that the room name and number be kept on separate levels/layers. Very often, the engineer will reference this information into their sheet file. However, some engineers reference both sets of information, while other engineers just reference the room number. This way, the option is available. The A-FLOR-OTLN definition will be revised to "Floor geometry/perimeter/building footprint, structural floor shape". The A-FLOR-RPRM definition will be revised to "Room perimeter shape (Interior finish floor surface)".
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Submitter: Lori Taylor, USAE District, St. Paul

Comment: I think the COLIBM cell should be removed since the steel MDL routine is used in the workspace.
Response: Concur. The symbol will be deleted.

Comment: Unless the COLCIR, COLSQR and DRAINF cells are needed by the workspace, I suggest these symbols be eliminated since circles and squares are so easy to generate in MicroStation and AutoCAD.
Response: Concur. These symbols will be deleted from the library.

Comment: Since the COLLIN symbol is already contained in the general symbology, is it needed in the structural?
Response: Typically structural engineers are the main users of this symbol, but occasionally other disciplines use this symbol in other model files (e.g., the Key Plan). Therefore, this symbol has been included in the General discipline library as well as the Structural library.

Comment: I believe the Center created a line style of the EEARTH symbol; therefore it should be deleted as a cell.
Response: Concur. The line style GROUND has been added to the Standard. This new line style will replace the cell EEARTH.

Comment: A while back I think sent you a cell library containing additional sheet pile cells, containing additional sheet pile connections and a library containing commonly used waterstops. In the tri-piles cell library, the only cells that would need to be added begin with "Z", you've already included the other shapes. (Lori Taylor included the sheet pile cells with this comment)
Response: Several sheet pile connection symbols have already been added to the structural cell library. The additional symbols provided by Lori Taylor will be added to the library.

Comment: I previously submitted several new line styles. Are they going to be included?
Response: Several new sheet pile line styles have been added to the Standard. These line styles include: PSA23, PS31, PZ22, PZ27, PZ35, and PZ40.

Comment: In the structural library, I would also like to see a cell created for CMU that does not have an architectural finish on one side (smooth on both sides).
Response: Concur. Symbol will be added.
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Submitter: Mary Diel, USAE District, Sacramento

Comment: Floor plan door layer A-DOOR-FULL/A-DOORFUM color is way too heavy (magenta) for line weights. A thin line weight like blue is preferred. This same comment applies to plumbing fixture layers A-FLOR-PFIX/A-FLORPFM.
Response: In the workspace, the doors for this level/layer are placed as graphic symbols with the swing being blue (LW=0) and the door being green (LW=1). The level/layer should also be reduced to 0.25 mm (LW=1). For the plumbing fixtures levels/layers, the Architectural FAC agreed that the line weight for these items should be reduced to LW=1 (0.25 mm) so they stand out from the interior walls. When the Mechanical engineer references them into the Plumbing Piping Plan, level/layer symbology can be used to increase the weight.

Comment: There are not enough layers on sections and elevations to allow for thin and medium line weights for building elements.
Response: With the exception of identification and patterning levels/layers, the other SECT and ELEV levels/layers will have the line styles, widths, and colors designated as Varies. This will allow varying weights per level/layer.

Comment: The cyan color for layer A-SECT-MCUT/A-SECTMCM is extremely heavy and creates a "muddy" representation on building sections. Request this layer color be reduced to red or green.
Response: See the response to the comment above.

Comment: Detail layers: in general, magenta and cyan are too heavy for pen weights and should not be used for any of these layers.
Response: See the response to Gary Boyd's comment on Detail levels/layers.
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Submitter: Arturo Sosa, USAE District, Fort Worth

Comment: Fort Worth District is attempting to work with 3D models while keeping the extractions compliant to the standards. Has there been consideration to how the current standards will incorporate a single model file? Is there any planning ahead for this? "Someday we will work that way" is coming up fast.
Response: Even a single model file concept differs from software to software. Both MicroStation and AutoCAD actually use multiple files that are combined to form a single model file. In AutoCAD, for example, a building shell is generally created in a file, and floor plans are created in separate files and referenced in (using an XREF). The floor plans would also have to reference the exterior to see where the windows were. There is a great deal of complexity and flexibility in how these things could be done, and could vary greatly from office to office. This creates a need for heavy office standards.

ArchiCAD has approached this from a different direction, allowing a real single model file but allowing parts of the model to be assigned out (the opposite of assigning separate parts to be part of the whole).

As for the symbology, that is still fairly simple from a standards point of view. Additional levels/layers may need to be added, but the standard will apply only to the 2D drawings that are produced from the model file. The way the standard is implemented (putting both vertical and horizontal information into a 3D object) would not be part of the standard, only to make sure that when a plan section is taken through the building that all the symbology is correct for the output to a 2D file.

Triforma 3D walls have information contained within the object that references the wall symbology if shown in plan and other information if shown in elevation or vertical section. But this could also be achieved using a separate database with information.

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Submitter: Fred Hardy, USAE District, New England

Comment: This is something that has bothered me about the A/E/C Standard Appendix since they first came out but I kept neglecting to mention it. The tables should have a column under the 'Graphics' heading that gives the "MicroStation Line Wt". The "Line Width (mm)" column is really quite useless without having cheat-sheet to look at when using these tables.
Response: We will either add this information to the Line Width column, or put this information at the bottom of every model file. (Update: For Release 2.0 of the A/E/C CADD Standard, this was not accomplished. With the Workspace application, users should not have to refer to the line width tables, since the Workspace sets the level symbology automatically.

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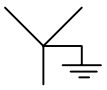
Submitter: Mark McNamara, USAE District, Omaha

Comment:

A. Recommended Symbols to Add.

1. WYEGNDCN XFMR Grounded Connection.
   This is a common connection used for transformers and
   It would be nice to have has one symbol.
   This symbol closely matches the symbols used in ANSI Y32.2 (1975).
   
   Response: Concur. Symbol will be added.

2. FAHORN2 Fire alarm horn. Recommend adding this symbol, since it is a companion to the fire alarm pull station FASTA symbol. On projects, which have more than one horn (symbol HRNSPK), this would make it easier to distinguish between different horns. It is unfortunate that this recommended symbol does not match NFPA 171.

   Response: In an effort to remain compliant with NFPA 170 - Standard for Fire Safety Symbols, this symbol will not be added to the A/E/C CADD Standard.

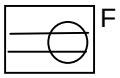
3. MOTDUR. Passive combination ultrasonic and infrared motion detector. Combination devices are getting fairly common in security systems. Recommend adding a symbol to cover this type of equipment. If someone has better idea on the lettering inside the circle that is fine.

   Response: Concur. Symbol will be added.

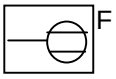
4. PSHST2. Two pushbutton station. A two pushbutton station is fairly common and having a cell would be helpful. 

   Response: Concur. Symbol will be added.
5. RECDFM. Double flush mount floor outlet. Floor outlets are being requested by the customer to be flush with the floor surface. It would be helpful to have a symbol to cover this situation.

   Response: Concur. Symbol will be added.

6. RECSFM. Single flush mount floor outlet. Floor outlets are being requested by the customer to be flush with the floor surface. It would be helpful to have a symbol to cover this situation.

   Response: Concur. Symbol will be added.
7. STP14B. Surface 1x4 strip with battery. Fixture would match STP14, except the circle would be solid to show it has a battery for emergency lighting.
   Response: Concur. Symbol will be added.
8. STP18B. Surface 1x8 strip with battery. Fixture would match STP18, except the circle would be solid to show it has a battery for emergency lighting.
   Response: Concur. Symbol will be added.
9. FIXSPB. Surface pendant fixture with battery. Fixture would match FIXSPR, except the circle would be solid to show it has a battery for emergency lighting.
   Response: Concur. Symbol will be added.
10. FIXWMB. Wall mounted fixture with battery. Fixture would match FIXWM, except the circle would be solid to show it has a battery for emergency lighting.
    Response: Concur. Symbol will be added.
11. FIXSPQ. Surface pendant fixture with quartz restrike. This is for a high intensity discharge type fixture which has a quartz restrike element for times power goes off and comes back immediately. This is not an emergency feature like a battery, but does help provide lighting quickly. It is normal not to have all the fixtures in an area not to have this feature, so either a different symbol is required or notes to identify the fixtures. Fixture would match FIXSPR, except half the circle would be solid to show it has quartz restrike.
    Response: Concur. Symbol will be added.
12. HRNSA2. Separate assembly horn and light. Recommend adding this symbol, since it is a companion to the fire alarm pull station FASTA symbol. It is unfortunate that this recommended symbol does not match NFPA 171.

    Response: In an effort to remain compliant with NFPA 170 - Standard for Fire Safety Symbols, this symbol will not be added to the A/E/C CADD Standard.
13. RECTFF. Floor flush mounted telephone outlet. This symbol would match RECTEF, except the letter “F” would be adjacent to the “box” to indicate the telephone outlet is flush mounted. This follows the same convention used for the power receptacles.
    Response: Concur. Symbol will be added.
14. RECTFR. Floor recessed mounted telephone outlet. This symbol would match RECTEF, except the letter “R” would be adjacent to the “box” to indicate the telephone outlet is flush mounted. This follows the same convention used for the power receptacles.
    Response: Concur. Symbol will be added.

15. RECTFS. Floor surface mounted telephone outlet. This symbol would match RECTEF, except the letters “SM” would be adjacent to the “box” to indicate the telephone outlet is flush mounted. This follows the same convention used for the power receptacles.
    Response: Concur. Symbol will be added.
14. EXITS1. Exit sign with one arrow. This sign would be like EXITCM, except it would have one arrow.
    Response: Symbol already exists within library as EXIT1 - EXIT LIGHT 1 ARROW.
15. RECSTL. Single communication outlet. This symbol would be used for wall mounted installation and would follow the pattern used for power receptacles. Provide an editable text field of two letters by the symbol.

    Response: Concur. Symbol will be added.
16. RECDTL. Two communication outlets. This symbol would be used for wall mounted installation and would follow the pattern used for power receptacles. Provide an editable text field of two letters by the symbol.

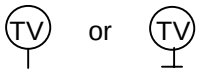
    Response: Concur. Symbol will be added.

Comment:

B. Recommended Changes to Symbols.

1. CCTVDU. CCTV Monitor desk unit. The cell shows an elongated “S” in the lower right corner. It isn’t clear what this represents. I would recommend dropping the “S”. The “S” would tend to get lost on the drawing.
   Response: Concur. Symbol will be revised.
2. CMPANL. Communication Panel. It appears the symbol is an “X”. If so, this symbol doesn’t give any information by shape, etc. on what it is and it could easily be confused with text and other information on the drawings. Recommend changing the symbol to a panel shape like that used for CPFCP fire alarm control panel. Text “COM” could be placed inside for communication or just leave empty.
   Response: Concur. Symbol will be revised.
3. CPTEST. CP test station. I would recommend added an editable field outside the symbol to allow easy designation of the type of test station. Projects typically have several types and /or configurations of test stations and it would make it easier to have a designation, which is part of the symbol instead of having to place a note by each.
   Response: This symbol is intended to represent a Cathodic Protection Test Station. Are there various types of these test stations? If so, a data field will be added to the symbol to account for these variations.
4. GENRTR Generator. It is recommended that the symbol be a circle with “GEN” inside it. This matches what ANSI Y32.2 (1975) had for a generator symbol. This symbol is easily recognized and understood.
   Response: Concur. Symbol will be revised.
5. MOTOR. Motor HP. It is recommended that the motor symbol go to a circle with an M in the center to match what ANSI Y32.2 (1975) has for a motor symbol. This is commonly used.
   Response: Concur. Symbol will be revised.
6. S3ABC 3. Three way switches. Remove the line from the switch. On a drawing the line will have the “S” hard to see and removing the line makes the switch symbol match the other light switch symbols that don’t have a line.
   Response: Concur. Symbol will be revised.
7. SABC. Three single switches. Remove the line from the switch. On a drawing the line will have the “S” hard to see and removing the line makes the switch symbol match the other light switch symbols that don’t have a line.
   Response: Concur. Symbol will be revised.

8. TVOUT. Television outlet. In order to keep consist with the symbology used for outlet, which is a designation within a circle, it is recommended the following be used for wall mounted television outlets.



Response: The present symbol, which represents a television outlet, is in accordance with the Architectural Graphic Standards.

9. EXITWM. Wall mounted exit sign light. The “X” in the center should extend to the circle to match the symbol used in EXITCM.
Response: EXITWM was taken from ANSI Y32.9 (1972) to represent a wall mounted exit light. EXITCM was taken from NFPA 170 to represent a ceiling mounted exit sign. To remain consistent with these two standards, the exit symbols will remain graphically in this standard as published in those standards.
10. FLTN. Floodlight new. It is recommended that the symbol be changed to more of a direction arrow to indicate the generally aiming direction of the floodlight.

Response: Will revise FLTN - Floodlight_new. An arrow will be added to the symbol to indicate the aiming direction of the light.
11. FLTX. Floodlight existing. It is recommended that the symbol be changed to more of a direction arrow to indicate the generally aiming direction of the floodlight and have the symbol open for existing.
Response: Will revise FLTX - Floodlight_existing. An arrow will be added to the symbol to indicate the aiming direction of the light.
12. FLTR. Floodlight remove. It is recommended that the symbol be changed to more of a direction arrow to indicate the generally aiming direction of the floodlight and have the symbol open for existing. Also the cross-hatching should be all in one direction instead of an “X”
Response: Will revise FLTR - Floodlight_remove. An arrow will be added to the symbol to indicate the aiming direction of the light.
13. FLTR, floodlight remove; LTPLR, light pole remove; SLLR, street light luminaire remove; UTPLR, pole remove; XFRPLR, XFMR pole remove; and XFRPMR, XFMR pad remove. It is recommended that the removal symbols have the cross-hatching going all in the same direction at 45 degrees. This is especially important on the light fixtures, for example, the “X” through the light versus LTPX; light pole existing is very subtle and could get lost on a drawing.
Response: If a linear pattern were used instead of the current "X" to designate removal symbols, in the event the design was plotted at half size, the removal symbols could be confused with new symbols. Using the "X" is the most applicable method of distinguishing items to be removed from new or existing items.